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Appl. No. 10/045,948  
Amdt. dated February 11, 2004  
Reply to Office action of September 11, 2003

**Remarks/Arguments**

In the specification, the applicant has replaced the heading at the top of page 8 with the language "Brief Description Of The Drawings" as suggested by the examiner. No new matter is added by this amendment. Claims 13, 18, and 23 have been amended to recite dependency to claims 12, 17 and 22, as suggested by the examiner. No new matter is added by this amendment.

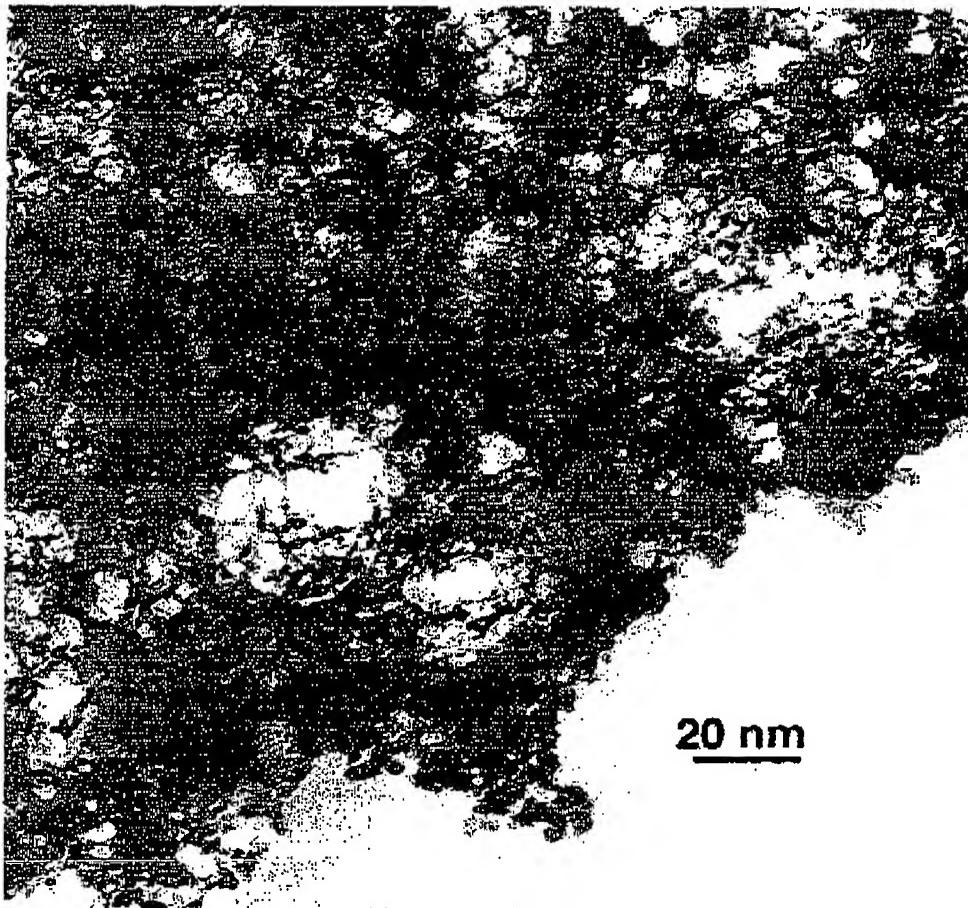
**35 U.S.C § 102(b)**

The examiner has rejected claims 1-5 and 7-9 under 35 U.S.C § 102(b) as being anticipated by Wirth et al., US Patent 5,716,705. The examiner argues that "while Wirth et al. may not use the term "aerogel", this is the common meaning for "dry alumina and silica" in example 1, column 8, line 15." The examiner's assertion as to the "common meaning" of these terms is both factually incorrect, and is further contradicted by the Wirth et al. reference.

As commonly used in the chemical industry the terms "dry alumina" and "dry silica" do not refer to aerogels. Rather, these terms are used for small particles, typically used in separation columns. The examiner should note that aerogels are NOT particles. Rather, as described by the applicant (and commonly understood by those having ordinary skill in the art), aerogels are "low-density, high surface area solid materials, typically ceramic oxides, which have been expanded using an explosive release of pressure, typically in a supercritical fluid (SCF) or by flash evaporation of a solvent from a sol-gel precursor solution. One of the more common aerogels is composed of silicon dioxide (or "silica"), which is presently available from a variety of commercial vendors. Aerogels commonly display remarkably high surface areas, achieved at minimal cost due to the simplicity of the method used for their synthesis. For example, silica aerogels exhibiting surface areas of approximately 1,250 m<sup>2</sup>/g, are commercially available." (emphasis added). The explosive release of pressure used to form aerogels does not result in the formation of particles; the material more closely resembles a molecular sponge. To better assist the examiner in visualizing an aerogel, a transmission electron

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micrograph of a base-catalysed silica aerogel taken from the Ernest Orlando Berkeley National Laboratory is provided below. Plainly, it is NOT a particle structure.



(image located at <http://eande.lbl.gov/ECS/aerogels/images/AEROGEL.JPG>)

In contrast to the explosive process used to form aerogels, the process for the industrial production of dry alumina is known as the BAYER process. The BAYER process is relatively old, having been created in 1887, one year after the invention of the electrolytic process by Hall and Héroult (the manufacturing of alumina from aluminium). This process was implemented for the first time in 1893, by the "pure alumina" company, in Gardanne (South of France), a setting close to both the bauxite and the coal that is

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necessary for the thermal supply. A full description of the process is provided by the Altech division of the Pechiney Group of France, located on the internet at:  
[http://www.altech.pechiney.com/Gardanne.nsf/vwUrl/MondeAlumine\\_Bayer\\_VI](http://www.altech.pechiney.com/Gardanne.nsf/vwUrl/MondeAlumine_Bayer_VI)

Not surprisingly, Altech sells "dry alumina," and provides a specification sheet for its product on the internet at:

[http://www.altech.pechiney.com/Gardanne.nsf/vwUrl/Business\\_Produits\\_Hydratedaluminas\\_Dryhydrates\\_VI](http://www.altech.pechiney.com/Gardanne.nsf/vwUrl/Business_Produits_Hydratedaluminas_Dryhydrates_VI)

A printed copy of the specification is provided herewith. The examiner's attention is drawn to the "Physical Characteristics" portion of the sheet which plainly lists particle sizes for the alumina. Ormet Corporation of Wheeling, West Virginia is another leading vendor of "dry alumina." A specification for Ormet's dry alumina is provided at <http://www.ormet.com/ec1.htm>, a printed copy of which is also provided. Note again that the Ormet product is also a small particle, having its physical properties described in terms of screen size. Should any doubt remain in the examiner's mind that "dry alumina" and "dry silica" commonly refer to small particles, the examiner is invited to type either of these terms into any internet search engine, whereupon the results will reveal numerous vendors offering products of small particles, substantially similar to those offered by Altech and Ormet.

Even if one assumes that some people use the terms "dry alumina" and "dry silica" somehow refer to aerogels, in contradiction to the use of these terms by major industrial producers as described above, it is plain that in the Wirth et al. reference at least, that is not the case. Rather, consistent with the common usage, Wirth et al. is describing particles, not aerogels. In example 1, column 8, line 18, for example, (the same example set forth by the examiner for the opposite proposition) Wirth et al refer to

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the silica as "particles." Plainly, even if the examiner considers the term "dry silica" to mean aerogels, Wirth et al. do not.

For this reason, the examiner cannot possibly set forth a prima facie case of anticipation under 35 USC 102. As it is axiomatic that a proper rejection under 35 U.S.C. 102 must contain each and every limitation of the claim, ("[a]nticipation requires the disclosure in a single prior art reference of each element of the claim under consideration" W.L. Gore & Assocs. V. Garlock, Inc., 721 F.2d 1540, 220 USPQ 303, 313 (Fed. Cir. 1983). Wirth et al. simply do not disclose the element of "aerogels", unless the terms "dry alumina" and "dry silica" are interpreted to mean something that Wirth et al. directly contradict in their specification.

The examiner is undoubtedly concerned about the apparent breadth of claim 1, and has done an admirable job in bringing to bear references that relate to the claim. Nevertheless, the fact remains that until the applicant's disclosure, no one had successfully formed "an aerogel having a monolayer coating" as required by claim 1-5 and 7-9. The applicants appreciate the examiner's efforts in providing a comprehensive examination, however, having shown that Wirth et al. do not disclose the use of aerogels, the applicants respectfully request that the examiner remove his objection under 35 USC 102 and allow claims 1-5 and 7-9 to issue.

**35 U.S.C § 112 second paragraph**

The examiner has rejected claims 13, 18 and 23 under 35 U.S.C § 112 second paragraph as being indefinite. The applicant has renumbered the dependency of claims 13, 18, and 23 in the manner suggested by the examiner, and respectfully requests that the examiner remove this ground of rejection

**Claims 6, 10-12, 14-17, 19-22, 24 and 25**

The applicant notes the examiner's indication of claims 6, 10-12, 14-17, 19-22, 24 and 25 as allowable subject matter, and express their appreciation.

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Closure

Applicant has made an earnest attempt to place the above referenced application in condition for allowance and action toward that end is respectfully requested. Should the examiner have any further observations or comments, he is invited to contact the undersigned for resolution.

Respectfully submitted,

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The undersigned hereby certifies that the forgoing Amendment dated February 11, 2004 in reply to the office action of September 11, 2003 (10 pages) with exhibits (5 pages), PTO Form PTO/SB/17 (fee sheet, 1 page, two copies), and return postcard are being deposited with the United States Postal Service as First Class Mail, postage prepaid, in an envelope addressed to

Mail Stop Non-Fee Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

on the date set forth below.

Douglas E. McKinley, Jr.  
Reg. No. 40,280

Feb. 11, 2004

Date



**Business corner**  
Products  
Applications  
Customer Area  
Bauxaline

## Business corner > Products > Hydrated aluminas

### Dry Hydrates

These aluminas are obtained by drying wet aluminium trihydrate produced by the Bayer process.

Business corner  
Products  
Applications  
Customer Area  
Bauxaline  
  
The site  
History  
Environment  
The Region  
  
The Process  
Aluminas  
Using aluminas

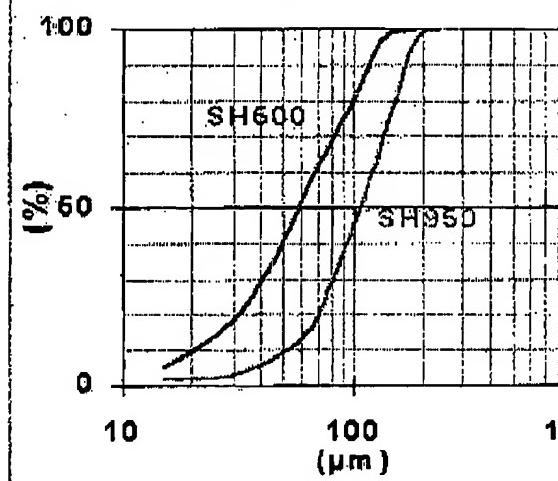
		SH600	SH950	SH910
<b>Free moisture</b>	%	0.1	0.1	0.1
$\text{d}50$	$\mu\text{m}$	55	90	90
<15 $\mu\text{m}$	%	8	1.5	1.5
<125 $\mu\text{m}$	%	93	80	80
<200 $\mu\text{m}$	%	-	-	0
$\text{Al}_2\text{O}_3$	%	65	65	65
$\text{Na}_2\text{O}$ tit.	ppm	2500	1600	1600
$\text{CaO}$	ppm	100	100	100
$\text{SiO}_2$	ppm	50	50	50
$\text{Fe}_2\text{O}_3$	ppm	60	65	65

They can be used in the same fields of application as wet hydrates, whether that be alumini sulphate, poly aluminium chloride (PAC), sodium aluminate, catalysts, catalyst supports, inc sieves or zeolites. The choice between the two products (wet or dry) mainly depends on the logistic conditions and on the process to be used.

Dry alumina hydrate is more specifically used for titanium dioxide coating, in the glass industry and in standard ceramics.

Dried hydrated alumina is also used as a filler in resins, for its fire retarding properties, for its electrical insulating qualities and for the mechanical qualities that it gives to the obtained composite.

Particle size distribution



Previous :

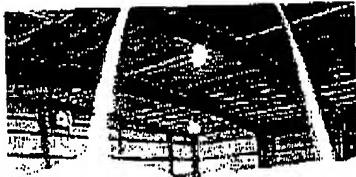
Wet hydrates

Next :

Ground dry hydrates

## Untitled Document

MATERIALS &amp; SERVICES

**SPECIALTY ALUMINAS**

- EH-30WC
- EH-30
- EC-1



Order entry / Customer service	Marketing/Sales
Phone: (225) 474-3712	Phone: (225) 474-3777
Fax: (225) 474-3797	Fax: (225) 474-3780  E-mail: <a href="mailto:hydrate@ormet.com">hydrate@ormet.com</a>

These quality products are available at competitive prices on either a FOB Burnside, Louisiana or a delivered basis, with Ormet's Burnside facility both experienced and knowledgeable on shipping via truck, rail or barge.

EH-30 WC Hydrated Alumina wetcake and the dry EH-30 Hydrated Alumina are the "first fruit" of the Bayer Process and act as precursors in the manufacture of various chemical products such as aluminum sulfate and sodium aluminate; engineered products such as molecular sieves and activated aluminas; and as a flame retardant in various plastics and rubber.

<b>EH-30WC - Wet Alumina Trihydrate</b>		
<b>CHEMICAL</b>	<b>TYPICAL</b>	<b>GUARAN-TEED</b>
SiO <sub>2</sub>	0.008	0.020 Max
Fe <sub>2</sub> O	0.010	0.025 Max
TiO <sub>2</sub>	0.003	0.006 Max
Na <sub>2</sub> O (non-leachable)	0.150	0.360 Max

## Untitled Document

Na <sub>2</sub> O (leachable)	0.040	0.120 Max
Al <sub>2</sub> O <sub>3</sub>	-	64.5 Min
LOI	34.6	35.8 Max 34.0
PHYSICAL	TYPICAL	GUARAN-TEED
Moisture	8.5	15.0 Max
Oxylates	< .003	0.01 Max
H <sub>2</sub> SO <sub>4</sub> Insol	-	0.07 Max
Caustic Insoluble	0.03	0.10 Max
SCREENS:	TYPICAL	GUARAN-TEED
+ 100	8%	20% Max
+325	95%	85% Min

\* All analysis, except moisture, on dry hydrate basis.

EH-30 - Dry Alumina Trihydrate		
CHEMICAL	TYPICAL	GUARAN-TEED
SiO <sub>2</sub>		

## Untitled Document

	0.008	0.020 Max
Fe <sub>2</sub> O	0.010	0.025 Max
TiO <sub>2</sub>	0.003	0.006 Max
Na <sub>2</sub> O (non-leachable)	0.150	0.360 Max
Na <sub>2</sub> O (leachable)	0.040	0.120 Max
Al <sub>2</sub> O <sub>2</sub>	-	64.5 Min
LOI	34.6	35.8 Max 34.0
<b>PHYSICAL</b>	<b>TYPICAL</b>	<b>GUARAN-TEED</b>
Moisture	0.05.	0.1 Max
Oxylates	< .003	0.05 Max
H <sub>2</sub> SO <sub>4</sub> Insol	-	0.07 Max
Caustic Insoluble	0.03	0.10 Max
<b>SCREENS</b>	<b>TYPICAL</b>	<b>GUARANTEED</b>
+100	8%	20% Max
+325	95%	85% Min

\* All analysis, except moisture, on dry hydrate basis.

EC-1 Calcined Alumina is Smelter Grade Alumina (SGA), manufactured via the Bayer Process. Although designed for use in hall cells for aluminum production, EC-1 Calcined Alumina also finds application in other non-stringent industrial ceramics.

<b>EC-1 - Smelter Grade Alumina</b>		
<b>CHEMICAL</b>	<b>TYPICAL</b>	<b>GUARAN-TEED</b>
Na <sub>2</sub> O	0.34	0.50
SiO <sub>2</sub>		

	0.013	0.025
TiO <sub>2</sub>	0.005	0.010
Fe <sub>2</sub> O <sub>3</sub>	0.018	0.030
LOI (300° - 1,000°C)	0.90	-
PHYSICAL	TYPICAL	GUARAN-TEED
Surface Area (m <sup>2</sup> /g)	55-70	-
Percent Alpha, %	13-15	-
Ultimate Crystal Size (um)	<1	<1
PARTICLE SIZE ANALYSIS: (TYLER STANDARD)	REGULAR	GUARAN-TEED
% on 100 Mesh	8	-
% on 200 Mesh	70	-
% on 325 Mesh	95	-
% through 325 Mesh	5	-